

QA: QA

**U. S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
OFFICE OF QUALITY ASSURANCE**

AUDIT REPORT BSC-ARC-01-10

OF THE

BECHTEL SAIC COMPANY, LLC

AT

LAS VEGAS, NV

LAWRENCE LIVERMORE NATIONAL LABORATORY, LIVERMORE, CA

LAWRENCE BERKLEY NATIONAL LABORATORY, BERKLEY, CA

LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS, NM

SANDIA NATIONAL LABORATORIES, ALBUQUERQUE, NM

JUNE 11 THROUGH JUNE 20, 2001

Prepared by: _____ Date: _____

**John R. Doyle
Audit Team Leader
Office of Quality Assurance/
Navarro Quality Services**

Approved by: _____ Date: _____

**Robert W. Clark
Director
Office of Quality Assurance**

1.0 EXECUTIVE SUMMARY

As a result of quality assurance (QA) limited scope compliance-based audit, BSC-ARC-01-10, the audit team determined that, with the exception of the conditions adverse to quality (CAQ) identified, the Bechtel SAIC Company, LLC (BSC), Lawrence Berkeley National Laboratory (LBNL), Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), and Sandia National Laboratories (SNL) are satisfactorily and effectively implementing the examined portions of the U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management (OCRWM), DOE/RW-0333P, Revision 10, *Quality Assurance Requirements and Description* (QARD) document, and applicable implementing procedures.

QA Program Sections 12.0, 15.0, Supplement I, III and V were determined to be effectively implemented based on activities evaluated during the audit.

The audit team identified several CAQ that resulted in the issuance of the following six Deficiency Reports (DRs) and one Deficiency Identification and Referral (DIR). The CAQ are detailed in Section 5.5.2 of this report.

BSC-01-D-096 identified that supplements/records to scientific notebooks (SN) were not adequately cross-referenced.

BSC-01-D-097 documents that online review checklists required by Administrative Procedure (AP)-SIII.4Q, Revision 0, ICN 2, BSCN 1, *Development, Review, Online Placement, And Maintenance Of Individual Reference Information Base Data Items* were not being completed/approved.

LLNL-01-D-98 identified that Measuring & Test Equipment (M&TE) was not properly tagged/identified.

BSC-01-D-099 documents that no Technical Work Plan was in effect for ANL-EBS-MD-00049, Revision 0, ICN 1, *Multiscale Thermohydrologic Model*.

BSC-01-D-100 identified that controls for Supplement V were not adequately addressed.

YMSCO-01-D-101 identifies that AP-SIII.6Q, Revision 0, *Geophysical Logging Programs for Surface-Based Testing Program Boreholes*, is inadequate. The process section does not provide the management processes required to achieve the assertions to the purpose.

DIR-01-4 identified that software users requests have not been submitted to Software Configuration Management. This CAQ has been referred to Corrective Action Report (CAR) BSC-01-C-002.

The audit team identified two CAQ requiring only remedial actions that were corrected during the audit (CDA).

CDA #1 identified that in process entries for computer information (hardware/model) were not entered into the scientific notebook used for the scientific investigation. The entries were made by the principal investigator during the audit.

CDA #2 identified that electronic backup medium was not labeled/stored on a daily basis. This was an isolated instance for one day's data collection. Backup medium was labeled and stored properly during the audit.

The audit team evaluated the effectiveness of corrective actions for four previously issued BSC deficiencies. Overall results of these reviews reveal that committed corrective actions were effective to prevent recurrence. The evaluation results are documented in Section 5.5.3 of this report.

2.0 SCOPE

Auditors representing the DOE's Office of Quality Assurance (OQA) conducted a limited scope compliance-based audit to evaluate the BSC implementation of the OCRWM QA Program, as described in the QARD and implementing procedures. The audit team, through interviews of cognizant personnel, reviews of documentation, and evaluation of procedures, assessed implementation, adequacy, and effectiveness of BSC implementation of the QA program.

The audit team reviewed the status of BSC deficiency documents generated during previous OQA audits and surveillances associated with the scope of this audit to determine the effectiveness of in process and completed corrective actions by BSC.

In accordance with the approved audit plan, the following QA Program Sections were evaluated:

12.0	Control of Measuring and Test Equipment
15.0	Nonconformances
Supplement I	Software Management
Supplement III	Scientific Investigation
Supplement V	Control of the Electronic Management of Data

The audit was conducted at the BSC offices in Las Vegas, Nevada; LBNL, Berkley California; LLNL, Livermore California; LANL, Los Alamos, New Mexico; and SNL, Albuquerque, New Mexico.

3.0 AUDIT TEAM MEMBERS AND OBSERVERS

<u>Name/Title/Organization</u>	<u>QA Program Sections</u>
John R. Doyle, Audit Team Leader, OQA/ Navarro Quality Services (NQS)	15.0 (LLNL and LBNL)
Samuel E. Archuleta, Auditor, OQA/NQS	Supplements I and V (BSC, LLNL and LBNL)
Patrick V. Auer, Auditor, OQA/NQS	12.0 and 15.0 (LANL and SNL) Supplement III (LANL and SNL)
George T. Harper, Jr., Auditor, OQA/NQS	Supplement III (BSC)
Dennis C. Threatt, Auditor, OQA/NQS	Supplements I and V (BSC, LANL and SNL)
Chet D. Wright, Auditor, OQA/NQS	Supplement III (BSC, LBNL and LLNL)
	12.0 (LBNL and LLNL)

Observers

Robert Latta, U.S. Nuclear Regulatory Commission (NRC), On-Site Representative,
Las Vegas, Nevada
Thomas Matula, NRC, QA Specialist, Projects and Engineering Section, High-Level
Waste Branch, Washington, DC

4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED

A pre-audit meeting was held on June 11, 2001, at the LBNL offices Berkley, California with BSC and National Laboratory personnel on conference call, on June 11, 2001. Daily team/ observer briefing meetings were held and conducted to apprise BSC management and staff of the audit progress and any CAQ. A post-audit meeting was held at the BSC offices in Las Vegas, Nevada, on June 20, 2001, with National Laboratory personnel on conference call.

Personnel contacted during the audit, including those who attended the pre- and post-audit meetings, are listed in Attachment 1, "Personnel Contacted During the Audit."

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Effectiveness

The audit team concluded that, with the exception of the identified CAQ, BSC and the National Laboratories are satisfactorily and effectively implementing the examined portions of the QARD and applicable implementing procedures.

5.2 Stop Work or Immediate Corrective Actions Taken

There were no Stop Work Orders or immediate corrective actions as a result of the audit.

5.3 QA Program Audit Activities

Attachment 2, "Summary Table of Audit Results," provides the results for each QA Program Section audited. Details of audit activities, including objective evidence reviewed, are documented in the audit checklists.

5.4 Technical Audit Activities

An audit of technical activities was not included in the scope of the audit.

5.5 Summary of Conditions Adverse to Quality (CAQ)

The audit team identified several CAQ from which six DRs, two CDAs, and one DIR were issued as a result of this audit. These CAQ are detailed in Section 5.5.2 of this report.

5.5.1 Corrective Action Requests (CAR)

There were no CARs issued as a result of this audit.

5.5.2 Deficiency Reports (DR)

BSC-01-D-096. AP-SIII.1Q, Revision 1, ICN 0, *Scientific Notebooks*, requires attachments/supplemental records be referenced to the SN number and that the supplemental record displays the page of the associated SN. A review of SN-LANL-SCI-239 V1 and SN-SNL-SCI-021 V1 reveals that these ties were not maintained. In addition supplemental records were also identified as a "loose leaf binder" with no identification of the attachment number to the SN.

BSC-01-D-097. AP-SIII.4Q requires that a Online Review Checklist be approved and submitted with the Reference Information Base (RIB) records package in accordance with AP-17.1Q, Revision 2, *Record Resource Responsibilities for Inclusionary Records*. A review of RIB packages RIB0090 and 0093 revealed that these checklists were neither approved nor included in the final record package.

LLNL-01-D-098. AP-12.1Q, Revision 0, ICN 1, *Control of Measuring and Test Equipment and Calibration Standards*, requires that M&TE be tagged as to their calibration status and that equipment utilized be tracked on a master list of M&TE. A review of selected M&TE at LLNL Corrosion Studies Laboratory revealed that several M&TE found in use were not listed on the M&TE master list and/or were not tagged with the current calibration status.

BSC-01-D-099. AP-2.21Q, Revision 1, BSCN 1, *Quality Determinations and Planning for Scientific, Engineering and Regulatory Compliance Activities*, Section 2, requires a Technical Work Plan be approved and in place prior to an Analysis and Model Report (AMR) development. AMR ANL-EBS-MD-0049 Revision 0, ICN 1, has been developed with no evidence of a Technical Work Plan approved and in place.

BSC-01-D-100. AP-3.10Q, Revision 2, ICN 4, *Analyses and Models*, requires an evaluation to determine the need for Supplemental V controls in AMR development. A review of documentation associated with AMR ANL-EBS-MD-00033, Revision 1, *Engineered Barrier System Features Events and Processes and Degradation Modes Analysis* revealed that neither a copy of an evaluation nor a statement was in evidence for the AMR regarding the application of Supplement V controls.

YMSCO-01-D-101. AP-SIII.6Q, Section 5.0, "Process" of this procedure does not provide the management processes required to achieve the assertions of the Section 1.0, "Purpose" (e.g., it does not provide for a determination of applicability of the repeated data for intended use, an identification of applicable portions of the Site Characterization Plan and QARD Sections III.2.1 and III.2.4).

The following DIR was identified during the audit:

DIR 01-4. AP-SI.1Q, Revision 3, ICN 01, ECN 01, *Software Management*, requires that the responsible manager submit a Software User Request to the Software Configuration Secretariat to request distribution/access to a baselined software item. Five software codes referenced in AMR MDL-NBS-GS-000004, Revision 0, ICN 2, *Rock Properties Model* were found not to have Software User Requests on file as required by procedure. This condition has been identified as a DIR to CAR BSC-01-C-002.

The following CAQ were CDA:

CDA #1. One SNL SN, SN-SNL-SC1-022V1, no in-process entries were made to identify computer information utilized (hardware make/model, platforms etc.), programs utilized system configuration. Entries were made to the scientific notebook during the audit to correct this condition and were considered isolated in nature.

CDA #2. For AMR MDL-NBS-GS-000004, control of the electronic management of data was not implemented as described in SN SNL-SCI-022-V1, i.e., the backup medium was not labeled with the date and time of the backup and the backup not stored in a centralized secure storage area. This isolated instance was corrected by properly labeling the backup medium and placing it in a lockable file cabinet.

5.5.3 Follow-up of previously identified CAQ

LNLL-00-D-149. The DR noted the failure of LLNL internal calibration procedures to meet all the requirements of YAP-12.3Q, *Control of Measuring and Test Equipment and Calibration Standards*. LLNL calibration procedures were reviewed during the course of the audit. No additional occurrences of this condition were identified during the audit.

LBNL-01-D-033. The DR noted a failure of opening a SN while conducting scientific investigations. No additional occurrences of this condition were identified during the audit.

SNL-01-D-012. The DR noted a failure to have a SN on location while performing Plate Load Testing in the Exploratory Studies Facility. No additional occurrences of this condition were identified during the audit.

LANL-ARC-01-D-006. The DR noted that calibration documentation did not meet the requirements of YAP-12.3Q. The audit team did not find additional occurrences of this condition.

6.0 RECOMMENDATIONS

There were no recommendations as a result of this audit.

7.0 LIST OF ATTACHMENTS

Attachment 1 – Personnel Contacted During the Audit
Attachment 2 – Summary Table of Audit Results
Attachment 3 - Acronyms/Abbreviations

ATTACHMENT 1
BSC-ARC-01-10
PERSONNEL CONTACTED DURING THE AUDIT

Name	Organization	Pre-Audit Meeting	Contacted During Audit	Post-Audit Meeting
Aden-Gleason, Nancy	LBNL/Engineering Assurance Manager	X	X	X
Andrews, Robert	BSC/Science and Analysis Project Manager	X	X	
Archuleta, Jose	SNL/Engineering Assurance Manager	X	X	X
Beall, George K.	BSC/Corrective Action Coordination (Projects Audit Coordination)	X		X
Belanger, Mike	LLNL/EA Manager	X	X	X
Bodvarssen, Bo	LBNL/Laboratory Lead	X		
Buenviaja, L. Paul	BSC/LANL QA On Site Representative	X		X
Burningham, Andrew	BSC/Lead Compliance Section	X		X
Castagna, Iris	SNL/Records Coordinator	X		
Cerregghino, Steve	BSC/License Application Project Manager			X
Cuzner, Marlene	LBNL/EA Specialist Scientific Notebook Coordinator	X	X	
Dana, Steve	BSC/Quality Engineering Support		X	
Darnell, Sounia	BSC/Technologist			X
Dixon, Paul	LANL/Laboratory Lead	X	X	X
Garcia, Magdalena	SNL/Records Coordinator	X		X
George, Tim	SNL/Principal Investigator		X	
Graff, James	BSC, SNL QA On Site Representative	X	X	X
Greene, Henry	BSC/Quality Engineering Support	X		X
Gundlach, Brad	LANL/Software Configuration Management		X	
Harris, Steve	BSC/LBNL QA On Site Representative	X	X	X
Hartstern, Robert	BSC/Quality Assessment Manager	X		
Hasson, Robert	NQS/QA Verification Manager	X		X

Name	Organization	Pre-Audit Meeting	Contacted During Audit	Post-Audit Meeting
Hedegaard, Randy	LBNL/Software Coordinator	X	X	X
Hong-Niam Jow	SNL/Integration Manager	X		X
Horn, JoAnne	LLNL/PI Environmental Analysis and Monitoring		X	
James, Eloise	SNL/Technical Data Coordinator	X	X	X
Johnson, Wanda	BSC/Software Configuration Management		X	
Jones, Catherine	LANL/Graduate Research Assistance		X	
King, Ken	LLNL/Electrochemical and Surface Science		X	
Knop, Matthew	BSC/Technical Data Management		X	
Kuzio, Stephanie	SNL/Principal Investigator		X	
Kwicklis, Edward	LANL/Principal Investigator		X	
Lau, Peter	LBNL/Procurement Coordinator		X	
Mason, Jeff	BSC/Software Configuration Management		X	
Martinez, Cleovis	BSC/LANL Engineering Assurance Manager	X	X	X
McClung, Ivelina	LBNL/M&TE & Software Coordinator	X	X	X
McFall, Ken	BSC/Site Science QA		X	
McGrath, Lawrence	BSC/QA Procurement Quality Engineer			X
Melczer, Ed	BSC/LLNL, Principal Investigator		X	
Neubauer, Dan	BSC/ECRB Testing		X	
Nieder-Westermann, G.	LBNL/Program Coordinator	X	X	
Oliver, Ron	LANL/Lead Technical Coordination Office		X	
Orrell, Andrew	SNL/Laboratory Lead	X		X
Palay, Christian	BSC Support Staff		X	X
Pelletier, John	SNL/Information Compliance Manager		X	X
Persoff, Peter	LBNL/Document Checker	X		
Pointer, Ken	BSC/Regulatory Programs			X

Name	Organization	Pre-Audit Meeting	Contacted During Audit	Post-Audit Meeting
Rael, Howard	BSC/Surface Based Testing and Monitoring		X	
Ramsey, James	SNL/Principle Investigator Rock Properties AMR		X	
Reshel, Tanya	LLNL/Engineering Assurance M&TE Custodian	X	X	X
Schnieder, Julia T.	SNL/TSPA Documentation Analysts	X		X
Seranio, Ramon	LANL/Principal Investigator		X	
Sevougian, David	BSC/Duke Engineering Services Inc.		X	
Sims, Cherry	BSC/Software Configuration Management		X	
Smith, Christine	BSC/Software Configuration Management		X	
Splawn, Steve	BSC/Manager Software Configuration Management		X	
Swift, Peter	SNL Manager	X		
Taylor, Ronald	SNL/M&TE Custodian		X	
Terburg, Robert	LBNL/Technical Data Coordinator	X		
Therien, John	BSC/QA	X		X
Valladao, Carol	LBNL/Records Coordinator	X		
Wagner, Lester	NQS/QA Audit Lead	X		X
Warren, Charlie	BSC/LLNL On Site Representative	X	X	X
Watson, William	BSC/Integration Manager			X
Weaver, Jeff	BSC/Integration Manager	X		
Wemheuer, Robert	BSC/Manager Integrated Management of Technical Inputs	X		
Whitcraft, James	BSC/Manager of Engineering	X		X
Williams, Albert	DOE OQA/General Engineer			X
Williams, Nancy	BSC/Manager of Projects	X		
Young, James	LANL/Data Coordinator	X	X	X
Zeisloft, John	BSC/Compliance Specialist	X		X
Zinkevich, Fred	BSC/Corrective Action Coordination	X	X	X

ATTACHMENT 2

SUMMARY TABLE OF AUDIT RESULTS

QA Sects/ Activities	Implementing Documents	Checklist Pages					Deficiencies	Rec	Program Adequacy					Procedure Compliance					Overall Evaluation
		B S C	L A N L	L B N L	L L N L	S N L			B S C	L A N L	L B N L	L L N L	S N L	B S C	L A N L	L B N L	L L N L	S N L	
12	AP-12.1Q LANL-EES-13- OP-616	NA	86 - 95	26 - 32	56 - 62	119 - 126	LLNL-01-D- 098	N	NA	S	S	S	S	NA	S	S	U	S	SAT
15	AP-15.2Q	NA	96 - 99	33 - 36	63 - 66	127 - 130	N	N	NA	S	S	S	S	NA	S	S	S	S	SAT
SUPP I	AP-SI.1Q 033-YMP-QP3.8 NWI-CM-001Q	1 - 10	100 - 106	37 - 43	67 - 73	131 - 137	CDA-01 DIR-01-4	N	S	S	S	S	S	S	S	S	S	S	SAT
SUPP III	AP-SIII.1Q AP-SIII.4Q AP-SIII.5Q QAIP 20-1 LP-GL-001 to 003Q YAP-SIII.4Q AP-SIII.6Q YAP-SIII.5Q	11 - 21	107 - 115	44 - 52	74 - 82	138 - 148	YMSCO-01- D-101 BSC-01-D-097 BSC-01-D-096	N	NA	S	S	S	S	NA	S	S	S	S	SAT
SUPP V	AP-SV.1Q YMP-LBNL QIP- SV LANL-YMP-QP- S5.01 NWI-TDM-003 & 004 LP-IM-001Q	22 - 25	116 - 118	53 - 55	83 - 85	149 - 151	BSC-01-D-099 BSC-01-D-100 CDA-02	N	S	S	S	S	S	S	S	S	U	S	SAT
TOTAL	6 DRs 1 DIR 2 CDAs								SATISFACTORY										

Legend: CDA - Corrected During Audit
DIR - Deficiency Identification and Referral

DR - Deficiency Report
N - None

NA - Not Applicable
REC - Recommendation

S - Satisfactory
U - Unsatisfactory

ATTACHMENT 3

ACRONYMS/ABBREVIATIONS

AMR	Analysis and Model Report
AP	Administrative Procedure
BSC	Bechtel SAIC Company, LLC
CAR	Corrective Action Request
CAQ	Conditions Adverse to Quality
CDA	Corrected During the Audit
CIRS	Condition/Issue Identification and Reporting/Resolution System
DIR	Deficiency Identification and Referral
DOE	U.S Department of Energy
DR	Deficiency Report
LANL	Los Alamos National Laboratory
LBNL	Lawrence Berkeley National Laboratory
LLNL	Lawrence Livermore National Laboratory
M&TE	Measuring & Test Equipment
NRC	U.S. Nuclear Regulatory Commission
NQS	Navarro Quality Services
OCRWM	Office of Civilian Radioactive Waste Management
OQA	Office of Quality Assurance
QA	Quality Assurance
QARD	Quality Assurance Requirements and Description
RIB	Reference Information Database
SN	Scientific Notebook
SNL	Sandia National Laboratories